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EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT PAPER NUMBER

2615

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/517,261

Applicant(s)

TABATA ET AL.

Examiner

Joseph Saunders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. This is the second office action based on the amendment filed September 28, 2006. Claims 1 – 31 have been canceled and new claims 32 – 53 have been added. Claims 32 – 53 are currently pending and addressed below.

Drawings

2. The drawings were received on September 28, 2006. These drawings are acceptable.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 35 – 39 which correspond previously to claims 13 – 17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant does not describe in the specification a single embodiment that details the configurations of claim 35 – 39. The specification discloses adding additional modifications to example 1 in order to derive examples 2 – 8. Nowhere in the specification does the Applicant disclose combining modifications of example 2 with the

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additional modifications disclosed by examples 3 – 8. To illustrate, example 2 describes the modification of example 1 where the flexible portion of the edge is divided into a circumferential direction with convex and concave portions alternately arranged, Figures 6 – 8 and claim 33. Example 4 discloses the modification of example 1 where the flexible portion of the edge is formed to have concave and convex corrugations alternately arranged in a radial direction, Figures 4 – 5 and claim 36. But a single embodiment in which features of example 2 are combined with features of example 4 is not present. Likewise with respect to limitations of claims 35 and 37 – 39 the specification only discloses their key modification being added to example 1 and not example 2 therefore the limitations of claims 35 and 37 – 39 are also not disclosed in a single embodiment together with the limitation of the flexible portion of the edge being divided into a circumferential direction with convex and concave portions alternately arranged from claim 33 or example 2.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 32, 40 – 41, 47, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) in view of Takahashi et al. (US 2003/0002695 A1).

Claims 32, 40 – 41, 47, and 53: Espiritu discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit (not shown however is inherent for this type of speaker configuration in Figure 3); and a diaphragm having an outer peripheral portion bonded to said frame via an edge (Paragraph 33 and Figure 3), and also having an inner peripheral portion bonded to said voice coil, and a thickness of a sectional shape of an inner peripheral portion of said edge is thinner than a thickness of a sectional shape of an outer peripheral portion of said edge (Paragraph 47 and Figure 8). Espiritu *does not disclose* wherein said edge is made of a foamed resin including both an independent foam and a continuous foam, wherein an expansion ratio of said foamed resin differs between said inner peripheral portions of said edge and said outer peripheral portion of said edge, wherein said edge includes a skin layer on said foamed resin, and wherein said diaphragm and said edge are unitarily formed. Espiritu does disclose that the surround (edge) may be made of rubber, or compressed foam rubber (Paragraph 40) and applicant discloses in his specification that rubber is also a possible material for the edge. Takahashi goes into more detail about a loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both of independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill

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in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu with the loudspeaker foam material of Takahashi since compared to conventional foam material the continuous foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22).

6. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) and Takahashi et al. (US 2003/0002695 A1) in view of Saiki et al. (5,371,805).

Claim 33: Espiritu and Takahashi disclose the loudspeaker according to claim 32, but *do not disclose* wherein said edge includes convexities and concavities alternately arranged in a peripheral direction of said edge. Saiki discloses a loudspeaker of similar configuration where the edge is divided into alternately arranged convexly rolled and concavely rolled pieces (Column 4 Lines 1 – 6). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Saiki since “secondary harmonic distortion of sound pressure characteristics, which is caused by the differences between quantities of air displaced by the edge member in the forward

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and rearward vibrations of the diaphragm, can be greatly reduced" (Column 2 Lines 39 – 44).

7. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saiki et al. (5,371,805) in view of Takahashi et al. (US 2003/0002695 A1).

Claim 49: Saiki discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit; and a diaphragm having an outer peripheral portion bonded to said frame via an edge, and also having an inner peripheral portion bonded to said voice coil (Column 3 Lines 55 – 68), wherein said edge is divided into a plurality of sections in a circumferential direction with convex portions and concave portions alternately arranged (Column 4 Lines 1 – 6). Saiki *does not disclose* wherein said edge is made of foamed resin including both independent foam and a continuous foam. Takahashi goes into more detail about a loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Saiki with the loudspeaker foam material of Takahashi

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since compared to conventional foam material the continuous foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22).

8. Claims 34 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1), Takahashi et al. (US 2003/0002695 A1), and Saiki et al. (5,371,805) in view of Koura et al. (PUB. NO. JP 05-122791 A).

Claims 34 and 39: Espiritu, Takahashi, and Saiki disclose the loudspeaker according to claim 33, wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41) but *do not disclose* a variation in thickness of said edge in a lengthwise direction of the loudspeaker is greater than a variation in thickness of said edge in a widthwise direction of the loudspeaker, and a thickness of said edge in a lengthwise direction of the loudspeaker is greater than a thickness of said edge in a widthwise direction of the loudspeaker. Koura discloses a loudspeaker where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. Also since the

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thickness of the edge is varied at different sections and the thickness may be greater in some sections than other sections along the edge, while at the same time the edge as disclosed by Espiritu, Takahashi, and Saiki is thicker at its outer peripheral than inner peripheral, the ratio from thick to thin in some sections may be greater than the ratio from thick to thin in other sections due to the improvement disclosed by Koura. It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Takahashi, and Saiki incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker since the edge sections of varying thickness may be spaced in any manner along the edge and would be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Paragraph 11 of Translation).

9. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1), Takahashi et al. (US 2003/0002695 A1), Saiki et al. (5,371,805), and Koura et al. (PUB. NO. JP 05-122791 A) in view of Sumiyama (PUB. NO. JP 06-125594 A).

Claim 35: Espiritu, Takahashi, Saiki, and Koura disclose the loudspeaker according to claim 34, but *do not disclose* wherein a dimension of said inner peripheral portion of

said edge is smaller than a corresponding dimension of said outer peripheral portion said diaphragm. Sumiyama discloses a loudspeaker of similar configuration where the outer diameter of the diaphragm is larger than the clamp section of the edge (Drawing 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Takahashi, Saiki, and Koura incorporating the feature disclosed by Sumiyama since it allows for the diameter to be enlarged which increases low frequency reproduction while maintaining a small enclosure size (Paragraph 2 of Translation).

10. Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1), Takahashi et al. (US 2003/0002695 A1), Saiki et al. (5,371,805), and Koura et al. (PUB. NO. JP 05-122791 A) in view of Czerwinski (US 2003/0068064 A1).

Claim 36: Espiritu, Takahashi, Saiki, and Koura disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge is corrugated in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge.

Czerwinski discloses a loudspeaker of similar configuration where the cross section of the surround (edge) includes corrugations in the radial direction (Figure 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Takahashi, Saiki, and Koura incorporating the feature disclosed by Czerwinski since it allows for the diaphragm to be

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centered while providing a restoring force to keep the voice coil positioned within the magnetic gap (Paragraph 43).

Claim 38: Espiritu, Takahashi, Saiki, and Koura disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge includes ribs in a peripheral direction of said edge. Czerwinski discloses a loudspeaker of similar configuration where the surround (edge) includes a relatively less-compressed area in the circumferential direction of the edge (Paragraph 41 and Figure 1 Item 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Takahashi, Saiki, and Koura incorporating the feature disclosed by Czerwinski since it allows for "increased flexibility in a direction which is orthogonal to the diaphragm without losing any rigidity in any direction within the plane of the diaphragm" (Paragraph 44).

11. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1), Takahashi et al. (US 2003/0002695 A1), Saiki et al. (5,371,805), and Koura et al. (PUB. NO. JP 05-122791 A) in view of Irby et al. (US 6,611,604 B1).

Claim 37: Espiritu, Takahashi, Saiki, and Koura disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge includes ribs in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Irby

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discloses a loudspeaker of similar configuration where the surround (edge) has radially position ribs (Item 34). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Takahashi, Saiki, and Koura incorporating the feature disclosed by Irby since the ribs allow for better performance in the form of less distortion due to an increased rigidity of the surround (Column 2 Lines 55 – 64).

12. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) and Takahashi et al. (US 2003/0002695 A1) in view of Sumiyama (PUB. NO. JP 06-125594 A).

Claim 42: Espiritu and Takahashi discloses the loudspeaker according to claim 32, but *do not disclose* wherein a dimension of said inner peripheral portion of said edge is smaller than a corresponding dimension of said outer peripheral portion of said diaphragm. Sumiyama discloses a loudspeaker of similar configuration where the outer diameter of the diaphragm is larger than the clamp section of the edge (Drawing 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Sumiyama since it allows for the diameter to be enlarged which increases low frequency reproduction while maintaining a small enclosure size (Paragraph 2 of Translation).

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13. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sumiyama (PUB. NO. JP 06-125594 A) in view of Takahashi et al. (US 2003/0002695 A1).

Claim 50: Sumiyama discloses a loudspeaker comprising: at least a magnetic circuit; a frame connected to said magnetic circuit; and a diaphragm connected to a voice coil, an outer periphery of said diaphragm being bonded to said frame via an edge, and an inner periphery of said diaphragm being bonded to said voice coil, said voice coil being inserted into a magnetic gap of said magnetic circuit (Paragraph 3 of Translation), wherein a dimension of an inner peripheral of said edge being smaller than a corresponding dimension of said outer peripheral portion of said diaphragm (Paragraph 2 of Translation and Drawing 3). Sumiyama *does not disclose* wherein said edge is made of foamed resin including both independent foam and a continuous foam. Takahashi goes into more detail about a loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both of independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Sumiyama with the loudspeaker foam material of Takahashi since compared to conventional foam material the continuous

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foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22).

14. Claims 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) and Takahashi et al. (US 2003/0002695 A1) in view of Czerwinski (US 2003/0068064 A1).

Claim 43: Espiritu and Takahashi discloses the loudspeaker according to claim 32, but *do not disclose* wherein said edge is corrugated in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Czerwinski discloses a loudspeaker of similar configuration where the cross section of the surround (edge) includes corrugations in the radial direction (Figure 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Czerwinski since it allows for the diaphragm to be centered while providing a restoring force to keep the voice coil positioned within the magnetic gap (Paragraph 43).

Claim 45: Espiritu and Takahashi discloses the loudspeaker according to claim 32, but *do not disclose* wherein said edge includes ribs in a peripheral direction of said edge.

Czerwinski discloses a loudspeaker of similar configuration where the surround (edge) includes a relatively less-compressed area in the circumferential direction of the edge (Paragraph 41 and Figure 1 Item 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Czerwinski since it allows for "increased flexibility in a direction which is orthogonal to the diaphragm without losing any rigidity in any direction within the plane of the diaphragm" (Paragraph 44).

15. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czerwinski (US 2003/0068064 A1) in view of Takahashi et al. (US 2003/0002695 A1).

Claim 51: Czerwinski discloses a loudspeaker comprising: at least a magnetic circuit; a frame connected to said magnetic circuit; and a diaphragm connected to a voice coil, an outer periphery of said diaphragm being bonded to said frame via an edge, and an inner periphery of said diaphragm being bonded to said voice coil, said voice coil being inserted into a magnetic gap of said magnetic circuit (Paragraphs 39 and 40), with said edge being corrugated in a direction from an inner peripheral portion of said edge to an outer peripheral portion of said edge (Paragraph 43 and Figure 4). Czerwinski *does not disclose* wherein said edge is made of foamed resin including both and independent foam and a continuous foam. Takahashi goes into more detail about a loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed

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resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both of independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Czerwinski with the loudspeaker foam material of Takahashi since compared to conventional foam material the continuous foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22).

Claim 52: Czerwinski discloses a loudspeaker comprising: at least a magnetic circuit; a frame connected to said magnetic circuit; and a diaphragm connected to a voice coil, an outer periphery of said diaphragm being bonded to said frame via an edge, and an inner periphery of said diaphragm being bonded to said voice coil, said voice coil being inserted into a magnetic gap of said magnetic circuit (Paragraphs 39 and 40), and said edge includes ribs in a direction from an inner peripheral portion of said edge to an outer peripheral portion of said edge (Paragraph 41 and Figure 1 Item 30). Czerwinski *does not disclose* wherein said edge is made of foamed resin including both and independent foam and a continuous foam. Takahashi goes into more detail about a

loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both of independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Czerwinski with the loudspeaker foam material of Takahashi since compared to conventional foam material the continuous foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22).

16. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) and Takahashi et al. (US 2003/0002695 A1) in view of Irby et al. (US 6,611,604 B1).

Claim 44: Espiritu discloses the loudspeaker according to claim 32, but *do not disclose* wherein said edge includes ribs in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Irby discloses a loudspeaker of similar configuration where the surround (edge) has radially position ribs (Item 34). It

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would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Irby since the ribs allow for better performance in the form of less distortion due to an increased rigidity of the surround (Column 2 Lines 55 – 64).

17. Claims 46 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1) and Takahashi et al. (US 2003/0002695 A1) in view of Koura et al. (PUB. NO. JP 05-122791 A).

Claim 46: Espiritu and Takahashi disclose the loudspeaker according to claim 32, wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41) but *do not disclose* a thickness of said edge in a lengthwise direction of the loudspeaker is greater than a thickness of said edge in a widthwise direction of the loudspeaker. Koura discloses a loudspeaker where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker since the edge sections of varying thickness

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may be spaced in any manner along the edge and would be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Paragraph 11 of Translation).

Claim 48: Espiritu discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit (not shown however is inherent for this type of speaker configuration in Figure 3); and a diaphragm having an outer peripheral portion bonded to said frame via an edge (Paragraph 33 and Figure 3), and also having an inner peripheral portion bonded to said voice coil, and wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41). Espiritu does not disclose wherein said edge is made of a foamed resin including both an independent foam and a continuous foam, wherein an expansion ratio of said foamed resin differs between said inner peripheral portions of said edge and said outer peripheral portion of said edge, wherein said edge includes a skin layer on said foamed resin, wherein said diaphragm and said edge are unitarily formed, with a thickness of said edge in a lengthwise direction of the loudspeaker being greater than a thickness of said edge in a widthwise direction of the loudspeaker. Espiritu does disclose that the surround (edge) may be made of rubber, or compressed foam rubber (Paragraph 40) and applicant discloses in

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his specification that rubber is also a possible material for the edge. Takahashi goes into more detail about a loudspeaker diaphragm and does explicitly disclose a loudspeaker diaphragm made of a foamed resin (Paragraph 13) and shows the edge being uniformly molded with the diaphragm (Figures 1(a) – (d)). Takahashi further discloses wherein said foamed resin includes both of independent foam and continuous foam (Paragraph 19) and that the air permeability (expansion ratio) of the foam may be adjusted through coating or impregnating with a resin (skin layer). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu with the loudspeaker foam material of Takahashi since compared to conventional foam material the continuous foam material of low independent foam ratio allows for a high degree of flexibility in designing its shape and has good environmental resistance to heat (Paragraphs 24 – 26) while also allowing for the ability to change the air permeability of the material by coating or impregnating with a resin resulting in sufficient reproduction of high frequencies (Paragraph 22). Koura discloses a loudspeaker where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Takahashi incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker since the edge sections of varying thickness may be spaced in any

manner along the edge and would be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Paragraph 11 of Translation).

Response to Arguments

18. Applicant's arguments, see Page 10 Lines 1 – 6 in light of the amendment to the specification Page 7 Lines 15 - 25, filed September 28, 2006, with respect to the objection of to claim 17 have been fully considered and are persuasive. The objection of June 28, 2006 has been withdrawn.

19. Applicant's arguments, see Page 10 Lines 7 - 9, filed September 28, 2006, with respect to the rejection of claims 12 - 17 have been fully considered and due to clarification of the specification by Applicant's amendment the rejection to claim 12 is withdrawn, however the rejection of claims 13 – 17 corresponding to new claims 35 – 39 have not been addressed and were not corrected due to the amendment and therefore have not been withdrawn.

20. Applicant's arguments, filed September 28, 2006, with respect to the rejection of claims 2 and 3 have been fully considered but they are not persuasive. The Examiner disagrees with the Applicant with regards to the rejections in which the combination of

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Espiritu and Takahashi were used. Applicant argues that although Takahashi discloses that the foamed resin has “an independent foam ratio of one percent or less,” which would mean that the foam is both independent and continuous in a ratio of approximately 99 parts continuous to 1 part or less independent, that his intent is to not have both independent and continuous foam. The Examiner believes that Takahashi's intent is unclear and that while Takahashi does mention the benefits of not having a high independent foam ratio, nowhere does Takahashi teach that the independent foam should be completely eliminated. If Takahashi's intent were to have 100% continuous foam then Takahashi would not have specifically chosen TA-301, which has both independent and continuous foam. Therefore, with reference to the limitation that “the edge is made of a foamed resin including *both* independent foam and a continuous foam” which has been amended to be included in all new independent claims, the Examiner concludes that Takahashi does disclose the use of *both* independent and continuous foam as required by the limitation.

Conclusion

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS 

November 29, 2006


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SUPERVISORY PATENT EXAMINER